Statistical Programming 2021

Statistical Science 2864A

Course Outline

Course Information

Course Number and Name	SS2864A: Statistical Programming
Academic Term	Fall 2021
Lecture Hours	Tue 8:30-10:30 AM SSC 2036; Thu 8:30-9:30 AM SSC 2036
Tutorial Hours	Thu 9:30-10:30 AM HSB 16; Thu 10:30-11:30 am PAB 148
Delivery Mode	In person (for both lectures and tutorials)
Prerequiste(s)	A minimum mark of 60% in Statistical Sciences 2857A/B (or the former Statistical Sciences 2657A/B) or a minimum mark of 70% in one of Statistical Sciences 2035, Statistical Sciences 2141A/B, Statistical Sciences 2143A/B, Statistical Sciences 2244A/B, Biology 2244A/B, Economics 2222A/B, MOS 2242A/B, Psychology 2810; and enrollment in a module offered by the departments of Applied Mathematics; Mathematics; and Statistical and Actuarial Sciences.
Pre- or Corequisite(s)	Statistical Sciences 2858A/B for those using Statistical Sciences 2857A to meet the prerequisites.
Warning	Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Instructor and TA Information

Instructor	Yifan Li
Office	WSC 214A
Email	yli2763@uwo.ca
Office Hours	TBA

TA	Lingling Lin
Office	WSC 224
Email	llin285@uwo.ca
Office Hours	TBA

Students must use their Western (@uwo.ca) email addresses when contacting their instructor and TA.

Course Design

This course is an introduction to programming using a high level language (currently R).

Learning objectives

1. Elementary computer programming as needed in statistics and actuarial science.
2. Elementary statistical graphics.
3. Simulation of random variables and simple stochastic processes.
4. Numerical linear algebra.
5. Numerical function optimization.
6. The methodology of learning R in the future.
7. Basic programming habits in R.

The relevant Key Sessional Dates

Classes begin: September 8, 2021;

Reading Week: November 1–7, 2021;

Classes end: December 8, 2021.

Contingency plan for an in-person class pivoting to 100% online learning

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

Course Materials

The course will be mainly based on the lecture slides, which will be posted on OWL (http://owl.uwo.ca).

As a recommended option (but not mandatory), students may also turn to the following textbook and supplement references for more detailed learning and for their future study.

Textbook (for more related details)

W. John Braun and Duncan J. Murdoch (2021). A First Course in Statistical Programming with R. Cambridge University Press. 3rd Edition

Supplement references (for exploratory and future study)

Norman Matloff (2011). The Art of R Programming: A Tour of Statistical Software Design. Nigeria: No Starch Press. (This book focuses more on the programming side.)

Official website for R (where one can also download the latest version of R).

The manuals edited by the R Development Core Team (for more detailed coding instructions): An Introduction to R, The R language definition

The website for the book "Hands-On Programming with R" by Garrett Grolemund (which can be treated as an interesting journey of learning basics in R programming):

The website for the book "R for Data Science" by Hadley Wickham and Garrett Grolemund (focusing on how to analyze data using Tidyverse packages):

Students are responsible for checking the course OWL site (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. All course material will be posted to OWL: http://owl.uwo.ca. If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Technical Requirements

Students need a computer (desktop or laptop) with the newest version of R and R Studio installed.

Download R

Download R Studio

Students should bring a laptop to each class.

Methods of Evaluation

Assignments

There will be four assignments.

Midterms or Tests

There will be one in-class closed book two-hour midterm test: late October (TBA).

Final exam

There will be a three-hour closed book final examination.

The date and time for the three-hour final exam will be announced by the registrar's office. Students are required to wait until the final exam schedule is posted before making arrangements for travel over the Christmas period. Exams will NOT be moved to accommodate students who ignore this requirement.

Evaluation

The overall course grade will be calculated as listed below:

Assignments	20%
Midterm Test	35%
Final Exam	45%

Accommodated Evaluations

Late Submissions of Assignments by undergraduate students:

- Late assessments without illness self-reports will be subject to a late penalty of 20% per day or portion thereof, and assessments that are submitted 5 or more days late will not be graded.
- Late assessments with illness self-reports should be submitted within 24 hours of submission of the last illness self-report, after which they will be subject to a late penalty of 20% per day or portion thereof, and assessments that are submitted 5 or more days late will not be graded.

Missed Midterm or Test

The policy of the department of Statistical and Actuarial Sciences is that there will be no make-up exams for a missed midterm. For those that do legitimately miss a midterm and provide the required supporting documentation, the standard practice will be that the weight of the midterm will be reassigned to the final exam. If your reason is not deemed valid, then you will receive a mark of 0.

Rounding of Marks Statement

Across the Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. ***Final grades*** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.4 becomes 74, and 74.5 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g. a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark "bumping" will be denied.

Student Absences

Academic Consideration for Student Absences

Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

(i) Submitting a Self-Reported Absence (SRA) form provided that the conditions for submission are met. To be eligible for a Self-Reported Absence:

- an absence must be no more than 48 hours
- the assessments must be worth no more than 30% of the student's final grade
- no more than two SRAs may be submitted during the Fall/Winter term
- SRA is applicable to undergraduate students only

(ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.

(iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences – Undergraduate Students in First Entry Programs, see:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf,

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation

When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

Accommodation and Accessibility

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf

Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

In a closed book exam in this course, all electronic devices (including mobile phones and laptops) and course-related materials are not allowed.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

If Remote Proctoring Software is used in this course, including in the event of health lock-down, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at:

https://remoteproctoring.uwo.ca.

Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at (519) 661-2147 if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (http://www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mentalhealth) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, http://westernusc.ca/services.